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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/341,287	08/19/99	WOODS	J LC-302/PCT/U

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IM62/1003

EXAMINER

WILSON, D

ART UNIT PAPER NUMBER

1713

6

DATE MAILED: 10/03/00

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

<b>Office Action Summary</b>	Application N . 09/341,287	Applicant(s) WOODS ET AL.	
	Examiner D. R Wilson	Art Unit 1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.  
     4a) Of the above claim(s) 6,7,10,11 and 16-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5,8,9 and 12-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☒ Claims 1-18 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. § 119**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).  
     a) ☐ All    b) ☐ Some \* c) ☐ None of the CERTIFIED copies of the priority documents have been:  
         1. ☐ received.  
         2. ☐ received in Application No. (Series Code / Serial Number) \_\_\_\_.  
         3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

**Attachment(s)**

- |   |  |
|---|--|
| 15) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                  | 18) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____.  |
| 16) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                         | 19) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 17) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>3</u> . | 20) <input type="checkbox"/> Other: _____                                    |

Art Unit: 1713

**DETAILED ACTION**

***Lack of Unity***

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in response to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-15, drawn to a process for making hydroxy functional materials..

Group II, claim(s) 16, drawn to a hydroxy-functional material.

Group III, claim(s) 17-18, drawn to adhesive compositions.

2. The inventions listed as Groups I-III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The materials of Group II can be made by a different process than those of Group I. For instance an oxirane can be used as the hydroxyalkylating agent.

***Election of Species***

3. This application contains claims directed to the following genera of patentably distinct species of the claimed invention:

- a. For Group I inventions:
  - i. carboxylic acid-functionalized materials,
  - ii. Hydroxylating agents,
  - iii. phase transfer catalysts, and
  - iv. amphoteric agents, including the specie of none present.
- b. For Group II inventions:
  - v. hydroxyl-functionalized polymers.
- c. For Group III inventions:
  - vi. hydroxyl-functionalized polymers,
  - vii. polyisocyanates,

Art Unit: 1713

- viii. cycloaliphatic polyols,
- ix. acrylate monomers, and
- x. initiators

4. As appropriate to the elected group of inventions, applicant is required under 35 U.S.C. § 121 to elect a **single ultimate** disclosed specie for each of the above genera for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Where specific species are not identified in the claims applicant should elect a specific specie from the specification. An alternative method of election is to identify an Example which collectively exemplifies the elected species. Currently, Claims 1, 16 and 17 are generic to their respective groups.

5. Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

6. Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

7. Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

#### ***Conclusion to Election of Species Requirement***

8. During a telephone conversation with Mr. Steven C. Bauman on September 26, 2000 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-15. Affirmation of this election must be made by applicant in replying to this Office action. Applicant further elected the species as exemplified in Example 1, i.e., (a) a carboxylic acid -terminated butadiene acrylonitrile copolymer, (b) ethylene carbonate as the hydroxylating agent, (c) tetraethylammonium iodide as the phase transfer catalyst, and (d) no amphoteric agent present. Claims 16-18 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention. Claims 6-7 and 10-11 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected specie of the invention.

***Claim Rejections - 35 USC § 112, Second Paragraph***

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 1-5, 8-9 and 12-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. The languages of Claims 1 and 8 are indefinite because the meaning of "c", "t", "v" and "a" is not clear. If they represent integers, which would be assumed lacking another definition, then only homopolymers are represented by the formula shown. Assuming the claim is meant to include polymers of the dependent claims, perhaps applicants meant "c", "t", "v" and "a" to represent fractions of the monomers present, wherein "c", "t", "v" and "a" could each have a value from 0 to 1. However, this isn't stated. Further, it would still be indefinite unless the basis for calculating the fractions are known, e.g., weight or molar basis.

b. Claims 2 and 9 are indefinite because Claims 1 and 8 are not generic to polyethylenes, polyisobutylene or styrene containing polymers, i.e., there is no antecedent basis for these named species of the carboxylic acid-functionalized polymers. Further, unless Claims 1 and 8 are amended to make clear that "c", "t", "v" and "a" represent some fraction of the monomeric units present, then Claims 1 and 8 are also not generic to the copolymers, i.e., there is no antecedent basis for copolymers. There is also no antecedent basis for using combinations the carboxylic acid-functionalized polymers

c. Claims 3-4 are indefinite because Claim 1 lacks antecedent basis for using combinations of hydroxyalkylating agents

d. Claim 14 is indefinite because the weight of the "carboxylic acid-functionalized material" it is not known. Therefore it is not known what the 3 to 10 parts by weight of hydroxyalkylating reagent is based. It is also not seen where this is taught in the specification. Note that the specification (page 7, lines 8-35) teaches the use of a stoichiometric or slight excess of

Art Unit: 1713

hydroxyalkylating agent. However, at the same place it is taught that 2.2 equivalents of the agent per equivalent of carboxylic acid is considered to be a slight excess. A factor of 2.2 is hardly a slight excess. Note also that in Example 1, either the moles of cyclic carbonate or the weight must be in error because 9.23 grams is not 0.33 moles.

**35 U.S.C. § 103(a) Rejection**

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. Claims 1-17 and 36-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto in view of Examiner's Notice, in further view of Wu or Yoshino.

The preparation of hydroxyl-terminated polymers by reaction of ethylene oxide with carboxylic acid-terminated polymers, such as carboxylic acid-terminated acrylonitrile/butadiene polymers (CTBN), is well known as for instance is taught by Okamoto (see Claim 1). However, Okamoto is deficient in not teaching that ethylene carbonate can be used advantageously in place of the ethylene oxide.

The Examiner takes Notice that It is well known that reactions utilizing ethylene oxide have the disadvantage of ethylene oxide being a gaseous and highly toxic material. Applicant also appears to acknowledge this fact in the present specification (page 2). Yoshino teaches the synthesis of 2-hydroxyethyl derivatives of carboxylic acids by reaction of the acids with ethylene carbonate in the presence of tetraethylammonium halide catalysts (e.g., see title and abstract). Yoshino also teaches that

Art Unit: 1713

ethylene carbonate has been accepted as an alternative hydroxyethylating agent to the hazardous ethylene oxide (p 1266, 1<sup>st</sup> paragraph). Yoshino further teaches that tetraethylammonium iodide is the better catalyst (e.g., Table I). Yoshino exemplifies the use of a slight excess of ethylene carbonate in the examples (p.1270, right column). However, the optimum excess to use also would have been considered an obvious results effective variable to optimize.

It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233; *In re Reese* 129 USPQ 402.

Wu also teaches the advantageous use of ethylene carbonate to hydroxyethylate a number of polyacids including both aliphatic and aromatic acids (col. 1, lines 1-54). Tetraethylammonium iodide is among a number of catalysts named (col. 3, lines 44-66), and it would have been considered obvious to use said iodide with an expectation of equivalent results to the other catalysts disclosed.

Tetramethylammonium chloride is exemplified as a catalyst in Example 1. The ratio of ethylene carbonate to the polycarboxylic acid is taught to be preferably from about 0.25 to 2.5, expressed as moles of carbonate per equivalent of carboxylic acid (col. 3, line 67 to col. 4, line 6). Less than stoichiometric amounts are preferred for making polyesters as opposed to the hydroxyethyl derivatives. Thus, it would have been obvious to one of ordinary skill in the art to use an amount in excess of stoichiometric amounts to achieve just the hydroxyethyl esters, such as the specifically named ratio of about 2.5.

It would also have been obvious to one of ordinary skill in the art to use in place of the ethylene oxide and catalysts taught in the processes of Okamoto, ethylene carbonate and tetraethylammonium iodide catalyst as taught by either Yoshino or Wu, in order to prepare hydroxyethylated CTBN without using the hazardous and more difficult to handle ethylene oxide.

#### ***Art of Interest/Technological Background***

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Thomsen also teaches the use of ethylene carbonate for the hydroxyethylation of aromatic and aliphatic dicarboxylic acids.

#### ***Future Correspondence***

Art Unit: 1713

Any inquiry concerning this communication or earlier communications from the examiner should be directed to D. R Wilson whose telephone number is 703-308-2398.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 703-308-2450. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-5408 for regular communications and 703-305-3599 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-2351

A handwritten signature in black ink, appearing to read 'DR Wilson', with a long horizontal flourish extending to the right.

D. R Wilson  
Primary Examiner  
Art Unit 1713